

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) Solid state substrate adapted and configured for DNA immobilization, said solid state substrate having a thermal conductivity ratio of at least 0.1W/cmEK suitable for amplifying and immobilizing DNA, wherein the surface of the substrate is modified by a polar radical formed at the surface of the substrate by binding a chloride by irradiating the surface of the substrate with ultraviolet light in an atmosphere of chlorine gas to bind chloride to the substrate, and replacing the chloride by binding a carboxyl radical to the substrate by setting the substrate into a solution containing a sodium sebacate, wherein the sebacyl radical is introduced to the substrate using a titanium or an aluminum coupling agent.

2. (Previously Presented) A substrate as claimed in claim 1, wherein said substrate is synthetic diamond or diamond-like carbon.

Claims 3 - 6. (Cancelled)

7. (Previously Presented) The substrate as claimed in claim 1, wherein said polar radical is a sebacyl radical and said sebacyl radical is connected on a surface of said substrate through amide linkage.

Claims 8 - 12. (Cancelled)

13. (Previously Presented) A solid state substrate having DNA immobilized thereon, wherein said substrate is diamond or diamond like carbon and said substrate is chemically modified by binding a chloride by irradiating the substrate with ultraviolet light in a chlorine gas atmosphere, and then replacing the chloride with a hydroxyl radical by setting the substrate into a boiling alkali solution or steam, or an amino radical by irradiating the substrate with ultraviolet light in an atmosphere ammonia gas, or a sebacyl radical by setting the substrate into a solution containing sodium sebacate and coupling the sebacyl with a titanium or aluminum coupling agent.

14. (Previously Presented) The substrate having DNA immobilized thereon as claimed in claim 13, wherein said substrate has a sebacyl radical at a terminal through a hydrocarbon having from 1 to 10 carbon atoms on the surface of the substrate.

Claim 15 (Cancelled)

16. (Previously Presented) A chip for amplifying and immobilizing DNA wherein the surface of the chip is modified by binding a chloride by irradiating the chip with ultraviolet light in an atmosphere of chlorine gas, and replacing the chloride by a hydroxyl radical by setting the chip into a boiling alkali solution or steam, or an amino-radical by irradiating the chip with ultraviolet light in an atmosphere of ammonia gas, or a sebacyl by setting the chip into a solution containing sodium sebacate and coupling the sebacyl radical with an aluminum or titanium coupling agent.

Claims 17 - 38. (Cancelled)

39. (Previously Presented) The solid state substrate according to claim 1 wherein the surface of the substrate is roughened.

40. (Previously Presented) The solid state substrate according to claim 13 wherein the surface of the substrate is roughened.

41. (Previously Presented) The chip according to claim 16 wherein the surface of the chip is roughened.

42. (Previously Presented) A substrate having DNA immobilized thereon, said substrate having a surface modified to contain a sebacyl group, wherein said sebacyl radical is connected to the surface through a titanium coupling agent or an aluminum coupling agent.

43. (New) A solid state substrate having DNA immobilized thereon, wherein said substrate is diamond or diamond like carbon and said substrate is chemically modified by binding a chloride by irradiating the substrate with ultraviolet light in a chlorine gas atmosphere, and then replacing the chloride with a hydroxyl radical by setting the substrate into a boiling alkali solution or steam, or an amino radical by irradiating the substrate with ultraviolet light in an atmosphere of ammonia gas, or a sebacyl radical by setting the substrate into a solution containing sodium sebacate and coupling the sebacyl radical with a titanium or aluminum coupling agent;

Wherein said substrate has a sebacyl radical at a terminal through a hydrocarbon having from 1 to 10 carbon atoms on the surface of the substrate and said sebacyl radical

is connected on a surface of said substrate through an ester linkage.

44. (New) A solid state substrate having DNA immobilized thereon, wherein said substrate is diamond or diamond like carbon and said substrate is chemically modified by binding a chloride by irradiating the substrate with ultraviolet light in a chlorine gas atmosphere, and then replacing the chloride with a hydroxyl radical by setting the substrate into a boiling alkali solution or steam or an amino radical by irradiating the substrate with ultraviolet light in an atmosphere of ammonia gas, or a sebacyl radical by setting the substrate into a solution containing sodium sebacate and coupling the sebacyl radical with a titanium or aluminum coupling agent;

Wherein said substrate has a sebacyl radical at a terminal through a hydrocarbon having from 1 to 10 carbon atoms on the surface of the substrate and said sebacyl radical is connected on a surface of said substrate through an amide linkage.

45. (New) A solid state substrate having DNA immobilized thereon, wherein said substrate is diamond or diamond like carbon and said substrate is chemically modified by binding a chloride by irradiating the substrate with ultraviolet light in a chlorine gas atmosphere, and then replacing the chloride with a hydroxyl radical by setting the substrate into a boiling alkali solution or steam or an amino radical by irradiating the substrate with ultraviolet light in an atmosphere of ammonia gas, or a sebacyl radical by setting the substrate into a solution containing sodium sebacate and coupling the sebacyl radical with a titanium or aluminum coupling agent;

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Wherein the sebacyl radical is connected to a surface of said substrate with a silane coupling agent, a titanium coupling agent, or an aluminum coupling agent.